

Blunt Abdominal Injuries: Recent Trend in a Teaching Hospital of Eastern India

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ABSTRACT

Introduction: Abdominal trauma accounts for a significant number of trauma-related injuries and deaths. Motor vehicle accidents and violence are the leading causes of blunt and penetrating trauma to abdomen. The aim of the study was to assess the incidence of blunt injury abdomen, its clinical presentation, management, morbidity and mortality.

Material and Methods: This prospective clinical study was carried out on patients admitted at Patna Medical College Hospital, Patna. After admission, demographic data and detailed history was recorded. After thorough clinical examination, relevant diagnostic investigations performed and appropriate management was done on these patients.

Results: In our study on 166 cases road traffic accidents (RTA) were the most common cause of blunt abdominal trauma (65%). 61.5% patients were males. Diagnostic aspiration was an important investigation apart from X-ray abdomen in erect posture and ultrasound of the abdomen. Investigation of choice for hollow viscous injury and solid organ injuries was X-ray and US respectively, spleen being the most common organ involved in the latter group. The commonest cause of death was septicemia.

Conclusion: Road Accidents constitute the most common cause of this injury; hence, measures to prevent these accidents and prompt care of the victims at the accident site is imperative. A thorough clinical examination and appropriate diagnostic investigations will improve favourable outcome of treatment in these patients.

Keywords: Blunt Injury Abdomen, Mortality, Road Traffic Accidents

INTRODUCTION

Various types of abdominal trauma account for a vast number of cases admitted to trauma wing of surgical casualty and leads to significant number of trauma related deaths. Apart from penetrating and firearm injuries, blunt injury to the abdomen poses several diagnostic and management challenges. This type of injury can result from road traffic accidents, fall from height, physical assault with blunt objects, sports injuries, and sometimes bomb blasts. Deaths and complications due to blunt abdominal trauma can be minimized by improved resuscitation, evaluation, and rational early treatment. Rapid resuscitation is mandatory to save the unstable but salvageable patient with abdominal trauma. Proper and prompt evaluation will help in accurate diagnosis facilitating timely surgical intervention and will save many lives. Road traffic accident in India accounts for nearly 75% of cases of blunt abdominal trauma. The incidence is on rise due to factors like rise in population, better quality of roads that

facilitates high speed in modern high-speed vehicles, lack of appreciation of sequelae of resultant trauma, terrorism, and sports injury. Unrecognized intra-abdominal injuries are frequently the cause for preventable death in a patient with blunt injury abdomen. Evaluation and management of a patient with abdominal trauma may be a most challenging task that a surgeon may be confronted with in his surgical practice. Clinical evaluation is the mainstay of diagnosis and investigative modality can only supplement it, not replace it. In view of increasing number of vehicles and consequent frequent road traffic accidents (RTAs), a prospective study on cases of blunt abdominal trauma was undertaken in the surgical casualty of this 2000 bedded teaching hospital in Bihar India.

The aim of the study was to evaluate the incidence of blunt abdominal injury, its clinical presentation, morbidity, and mortality in this part of country

MATERIAL AND METHODS

This prospective clinical study was on patients admitted to surgical casualty department at Patna Medical College Hospital, Patna, Bihar (India). Patients admitted with a history of blunt abdominal trauma due to various causes that underwent surgical intervention, or treated conservatively were included in the study. Patients with penetrating injuries, gunshot injuries were excluded from the study. Post admission, detailed but quick history was obtained by questionnaire with the patient or their accompanying relatives and data collected in standard format. Clinical findings were recorded and relevant diagnostic investigations performed on emergency basis. After initial resuscitation including blood transfusions when indicated, thorough assessments for injuries were carried out in all the patients. Documentation included, identification, history, clinical findings, diagnostic test, operative findings, operative procedures, postoperative course and complications during the stay in the hospital and during subsequent follow-up period. All findings were recorded in a proforma specially prepared. Demographic data included age, sex, occupation, and nature, cause and

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time of injury or accident. After initial resuscitation and hemodynamic stabilisation, all patients were subjected to careful examination. Depending on the clinical findings; decision was taken for further investigations such as four-quadrant aspiration, diagnostic peritoneal lavage, erect X-ray abdomen, and focused assessment with sonography for trauma. The decision for operative intervention or nonoperative management was decided on the basis of clinical examination, hemodynamic stability, and contrast enhanced computed tomography abdomen in selected cases. Patients selected for non-operative management were placed on strict bed rest and were subjected to serial periodic clinical examination which included hourly pulse rate, blood pressure, respiratory rate and repeated examination of abdomen and other systems. Prophylactic broad spectrum antibiotics and IV fluid resuscitation, analgesics, nasogastric suction etc were initiated on individual merits of the cases. Appropriate diagnostic tests, especially ultrasound of abdomen were repeated as and when required. In cases who underwent operative procedures, the operative findings were recorded. Cases were followed up after discharge from the hospital also for varying periods. Postoperative morbidity and duration of hospital stay were recorded and analysed.

RESULTS

The total number of patients who sustained blunt injuries to abdominal organs between January 20219 to December 2019 was 166. In the present study, most of the cases were in the 21-30 age group (36%) followed by 11-20 group (18%), mean age was 42 years, age ranged from 12 to 77 years. 102 (61.5%) patients were male and 64 (38.5%) were female. Male to female ratio was 1.6:1.

Commonest cause of blunt trauma to abdomen was RTA, i.e., 108 (65%) followed by fall from height 28(16.8%). Less common causes were physical assaults 18(10.8%), hit by blunt objects, 12(7.2%) (Figure 1). The commonest presenting symptom was pain abdomen (72%). Next symptom was vomiting (21.7%) followed by abdominal distention (13.3%), urinary retention (3.6%), and hematuria (3.6%) (Figure 2)

Ultrasound abdomen was done in 148 cases. X-ray erect abdomen was done in 154 cases. Four-quadrant aspirations were done in 92 cases, hemoglobin level in 158 and Routine urine examination in 132(Figure 3).

Spleen was the most common organ involved in 32 (32%) cases and liver was the second most common organ injured in 16 (16%) cases. Small bowel was injured in 14% of cases. Large bowel, mesentery, and stomach were injured in 4% of cases.

Out of 166 cases, 124 (74.6%) were managed surgically and 42 (25.4%) were managed conservatively

Post-operative complication occurred in 32 cases; the most common complication after surgery was wound infection. It was seen in 20 cases (62.5%). Pelvic abscess developed in 3 cases (9.4%). 2 patients (6.3%) developed pneumonia. Anastomotic leak in 3 cases(9.4%), intestinal obstruction, wound dehiscence developed in 2 case each 6.3%). In this

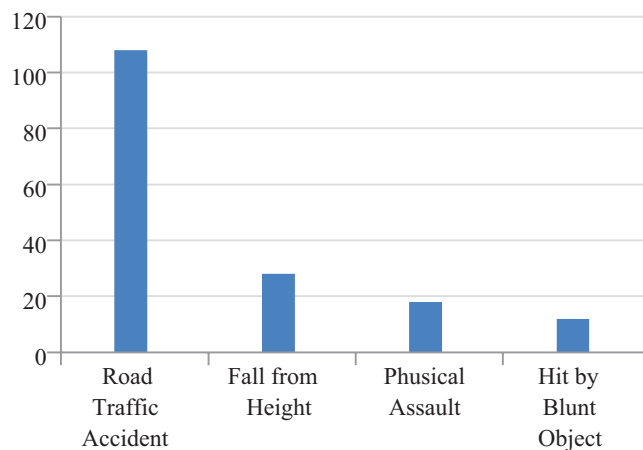


Figure-1: Various Causes

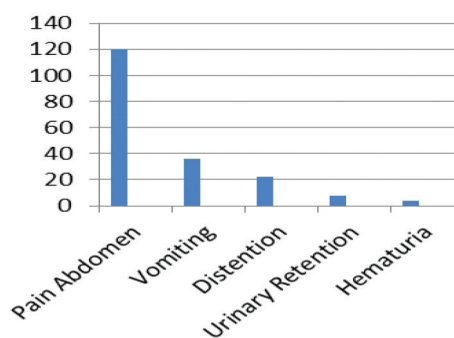


Figure-2: Symptoms

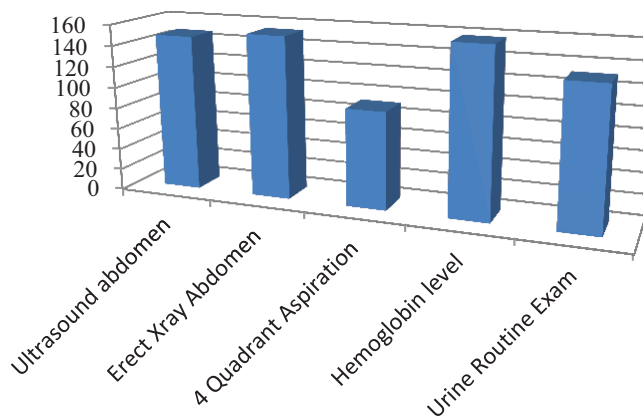


Figure-3: Investigations

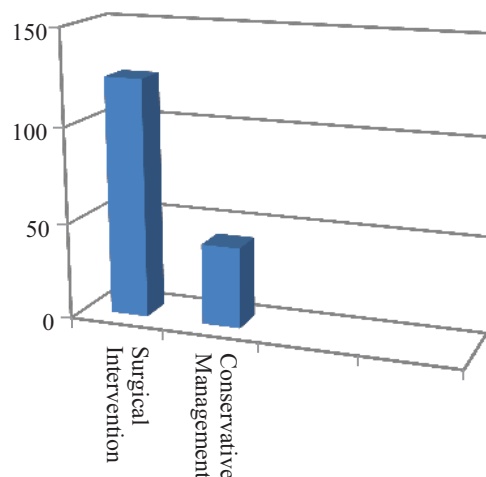


Figure-4: Management Protocol

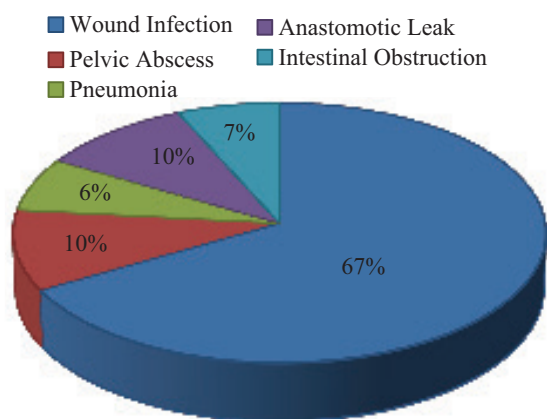


Figure-5: Postoperativ

study, septicemia was the most common cause of death (8 cases). 4 died of ARDS and another 4 died of sudden cardiac arrest (Figure 6).

DISCUSSION

The most common cause of blunt injury abdomen in this study is RTAs (65%) which are comparable to most other authors. Mohapatra et al.¹⁴ found 62% cases of blunt injury abdomen were due to RTA in their study Curie et al.¹⁰ reported 58.6% cases of blunt injury to abdomen were due to RTAs. In our study, the maximum number of cases belonged to third decade of life (20-30). Most of the cases were in the first four decades of life. This indicates trauma is more common in young people. Range was from 15 to 72 years. Average age was 39 years. Our study is comparable to study by Curie et al.² which showed maximum number of cases in the third decade (36%). Ranging from 12-77 years with a mean age of 37 years. Similar observations were also made by Allen et al.¹ who found 28% cases between 20 and 29 years of age.¹¹ In the present study, 61.5% were males and 38.5% were females. In our study, male-to-female ratio was 1.6:1, which is different from other studies such as Tripathi et al.⁵ reported a ratio of 4.4:1. This may be due to factors like different violence pattern and socioeconomic status in our part of the country. The most common symptom was pain abdomen (72%). Vomiting was the second most common symptom (21.7%), followed by distention of abdomen (13.3%), urinary retention and Hematuria (3.6% each). Tripathi et al.⁵ reported higher incidence (91%) of pain abdomen in their patients. Diagnostic aspiration was done in 92 patients and was positive in 81 cases. Out of these 81 cases, 78 cases underwent laparotomy and the results were found to be positive. True negative was found in 3 cases, false negative in 5 cases, and no false positive. Sensitivity was 96% and specificity was 100% in our study. This is comparable to another study by Mohapatra et al.¹⁴ which showed diagnostic aspiration to be accurate in 95% cases. Diagnostic aspiration in 92 cases in this study was positive in 90 cases (97.8%) cases while study by Narsing et al.⁶ showed diagnostic aspiration to be 100% accurate. This may be due to small amount of hemoperitoneum in some cases and experience of the technical staff. In our study, X-ray

erect abdomen was done in 154 cases. It detected 28 cases of hollow viscous perforation with an accuracy of 100%. Rest of the cases had gangrenous bowel. X-ray erect abdomen was not done in 12 cases due to shifting issues related to associated orthopaedic injuries. There was gastric tear in two cases. Mohapatra et al. (2003)¹⁴ reported accuracy of X-ray erect abdomen to be 100% in detecting hollow viscous injuries. In our study, ultrasonography (USG) abdomen was done in 148 cases out of 166 cases. 36 cases were found to have solid organ injuries on laparotomy. Out of these 36 cases, USG was not done in 3 cases preoperatively. In our study, USG was 81% sensitive in detecting solid organ injuries with the specificity of 100%. This is comparable to other studies such as Boutros et al. (2015) which showed USG to have 93 sensitivity, and 99% specificity.²⁶ However, it was not very helpful in detecting hollow viscous injuries. In our study, spleen was the most common organ injured in 34 (20.5%) of cases. Out of these 34 cases, 8 were managed conservatively and 26 were operated. Splenectomy was done in 22 cases and splenorrhaphy in 4 cases. Our study is comparable to study done by Davis et al.³ which reported 24.7% of cases had splenic injuries, out of which 10.7% were operated and 14% were managed conservatively. All the operated cases underwent splenorrhaphy in their series which is different from our findings. This may be due to more severe degree of trauma in our cases. Curie et al.² reported 27.5% of cases had splenic injuries, out of which 15% were operated and splenorrhaphy was done in all cases, explained similarly. Liver is the next most commonly involved solid organ in 22 cases, of which 16 were operated and 6 managed conservatively. Out of 16 cases operated cases, the laceration in the liver was sutured in four cases and gelatin sponge applied to prevent further bleeding in four cases. In other 12 cases, bleeding was already stopped and only hemoperitoneum was drained. This is comparable to study by Davis et al.³ which showed 16.47% of liver injuries, of which 14% underwent laparotomy and suturing was done in all cases. A study by Rutledge et al.⁸ found spleen to be most commonly injured organ than liver. Small bowel was third most commonly injured organ, i.e., 21 (12.6%) in our study. Duodenum was injured in 3 cases. In all the three cases, a small perforation was present, so a simple repair with omental patch was done. Jejunum was injured in 9 cases. In 4 cases required resection anastomosis and simple closure in rest 5 cases was done. Ileum was injured in 9 cases. In all the cases, simple closure was done. All cases of small bowel injury were operated, of which 2 patients expired. In our study, injury to small intestine was less compared to a study done by Allen et al.¹ which showed 35.3% cases. Out of 166 cases in our study, 124 (74.6%) were managed surgically and 42 (25.4%) were managed conservatively. Our reports are different from Mohapatra et al.¹⁴ who reported 39% laparotomy rates in their series. This may depend on severity and type of intraabdominal injury. Non-operative management consisted of nasogastric aspiration, urine output measurement, I.V fluids, analgesics, and antibiotics. In our study, a total of 56 cases were found to be having solid organ injury, of which 16

(28.6%) were managed conservatively and 40 cases (71.4%) were managed surgically. All patients in non-operative group recovered uneventfully. There were 3 mortalities in operative group. Our study shows that 28.6% of solid organ injuries can be managed nonoperatively. A study by Rutledge et al.⁸ also showed that incidence of non-operative management in 48% of both hepatic and splenic injuries which is again different from our findings. Wound infection was the most common complication in 14 (11.3%) cases after undergoing surgery followed by pelvic abscess in 3 (2.4%) cases. 4 cases (3.2%) of pneumonia, anastomotic leakage, and intestinal obstruction each. This is comparable to a study by Jolly et al.⁷ which showed wound infection in 14% of the cases. Another study by Davis et al.³ showed wound infection as a complication in 15% of the cases. Among 166 cases, 12 (7.2%) cases ended in mortality and septicemia was the most common cause of death in 8 cases. Sudden cardiac arrest was cause of death in 4 cases and ARDS was cause of death in 4 cases. These results are comparable to another study by Jolly et al.⁷ which showed 10% mortality in their study with septicemic shock the most common cause of death. Another study by Davis et al.³ showed 15% mortality with septicemia the most common cause of death

CONCLUSION

Blunt trauma to abdomen is on rise due to excessive use of motor vehicles and fast lifestyle in younger generation. It poses a diagnostic and therapeutic dilemma for the attending surgeon due to wide range of clinical manifestations ranging from trivial physical findings to extremely severe form. Hence it is advisable that trauma surgeon should rely mainly on his physical findings in association with the use of diagnostic modalities such as X-ray abdomen, USG abdomen, and abdominal paracentesis improves diagnostic accuracy and management outcome. Hollow viscus perforations are relatively easy to diagnose on X-ray. But solid organ injuries may be difficult to diagnose due to restricted use of modern amenities such as CT scan in India. From our study, we conclude that careful focussed clinical examination and early management will greatly improve outcome. Hemodynamically stable solid organ injury MAY be managed conservatively with encouraging favourable results.

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